Tennessee Pollution Prevention Partnership Success Story

David Lipscomb Elementary School
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David Lipscomb Elementary Tackles Energy Use

THE MEMBER

David Lipscomb Elementary School (PK-4th grade) enrolls approximately 380 students. The school is a private, Christian institution with 46 faculty and staff. It is part of the Campus School system of Lipscomb University, located in Nashville, TN. The original part of the building was constructed in the early 1950's for the public school system in Davidson County. Lipscomb purchased the campus in 1986, making additions and facelifts over the next 21 years. While the facility is attractive, the wiring and HVAC systems are older and inefficient in their energy usage.

THE STORY

In November 2007, an Energy Audit was conducted in the Elementary building to determine steps to reduce energy consumption. Energy Engineer, Fred Smithwick, of the Tennessee Energy Institute, recommended a school-wide lighting upgrade, including the metal halide fixtures in the gym, replacing T12 bulbs and magnetic ballasts with T8s and electronic ballasts. With the old equipment, the school was using $1.02 per square foot per year in gas and electricity, giving an "average efficiency" rating. The suggested improvements would reduce usage to $0.20 per square foot per year, allowing the savings to pay for upgrades in 2.3 years.

The estimated cost of replacing the lighting system throughout the elementary school is $36,760. While this total amount of funding is not currently available, the process has begun. The lighting in four 4th-grade classrooms and the 4th-grade wing hallway has been upgraded. All exit signs in the building have been upgraded to LED signs. As money becomes available, the lighting upgrade will continue.

Mr. Smithwick suggested that replacing the current HVAC system with a water source heat pump system or a geothermal heat pump system would improve efficiency. One classroom was converted in 2003 to geothermal heating to evaluate the benefit of this system. As a result of this successful experiment, new construction on the Lipscomb University campus installed geothermal heat pump systems, realized the payback in less than 2 years, and saved $250,000 in heating/cooling costs.

THE SUCCESS

Fourth-grade classrooms and hallway were chosen as the starting point for the lighting conversion because energy is part of the 4th grade science curriculum. During their study, these 58 students watched the film, *Kilowatt Ours*, and Jennifer Barrie presented a heads-on, hands-on workshop about coal and the dependency on it in the southeastern U.S. Ramona Nelson, from **T**ennessee **E**nergy **E**ducation **N**etwork (**TEEN**), presented an energy program to the group. She defined energy and discussed where it comes from, its uses, types of fuels, alternative energy sources, and the U.S. rate of energy consumption as compared to the rest of the world. As an extension of these two programs, each fourth-grader received TVA home energy assessment surveys. These were sent home so that parents would become involved. Those families who returned the audit will be presented home energy kits, including compact fluorescent bulbs, energy-efficient showerheads, and home insulation (to fit under light switch faceplates). Thirty-one homes returned their energy audits and will receive kits.

As a whole, Lipscomb students and staff are making efforts to conserve energy by turning off lights when they leave classrooms. Through email reminders, thermostats are adjusted for extended periods away from school; all computers are on 'sleep mode' and are turned off during school holidays.

THE POLLUTION PREVENTED

At this time, 150 T12 fluorescent bulbs in 75 magnetic ballasts have been replaced with T8 bulbs and electronic ballasts in the fourth-grade wing of our building. This represents a savings of approximately 11,057 kWhs for a 180-day school year (9-hour school day). Because of this reduction, approximately 11,057 pounds of coal will be conserved every year. We will also eliminate the emission of approximately 85.58 lbs. of SO_2, 38.04 lbs. of NOx, and 14,927 lbs. of CO_2. This beginning shows great potential for expanded energy savings as we continue the lighting upgrade (approximately 750 more bulbs).

There are 30 exit signs throughout the building. According to WattWatchers, burning 24-hours/day, 365 days/ year, the new LED signs will save 5256 kWhs of electricity and save $420.48 each year.

Awareness of the need for energy conservation has increased in Lipscomb Elementary community this year. We are proud to partner with the University to further the practice of sustainability and be an example in our community.

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